

LESLIE
ORGAN SPEAKER

"Pipe Voice of the Electric Organ"

The Orpheus

MODEL 25

OWNER'S MANUAL

INSTRUCTIONS, SERVICE INFORMATION

AND

PARTS LIST

ELECTRO  **MUSIC**

PASADENA

CALIFORNIA

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INSTALLATION

At Model 25 Cabinet

After removing lower back, take out motor shipping blocks, attach 30-ft. console cable, and proceed as follows:

At Consoles

1. Attach tremolo and echo controls to wooden rail directly in front of lower manual by choosing the two mounting holes on each control case which best centers wood screw in rail. Use wood screws provided. Controls can be located one at each end or together at either end.
2. Pass the control cables through openings to back compartment of consoles. Openings may be found in bottom side of lower manual shelf, left-hand side behind lower manual, or in corner of knee panel. If no openings are provided, drill $\frac{7}{8}$ " diameter hole in shelf below cheek block under lower manual.
3. Mount No. 26-1 Console Connector Chassis inside organ at any convenient point. Be sure control cables will reach unit before mounting with provided wood screws.
4. Attach Leslie Console Adapter to No. 26-1 Chassis. Since various spinet organs require different adapters to pick up power and signal, each adapter is packed with specific installation instructions about organ involved. (See page 10).
5. Plug in 30-ft. Leslie Console Cable and Control Cables. Installation is now ready for operation.

TYPE 25 BOOSTER AMPLIFIER

The "Orpheus" Speaker is basically designed to use the console amplifier, but when the console amplifier power is not sufficient or a multiple speaker installation is to be made, a Type 25 Amplifier giving 20 watts of power is recommended.

When amplifier is used with cabinet, the 30-ft. console cable still connects between the No. 26-1 Console Connector Chassis and the 6-pole plug on Cabinet Connector Chassis.

ADDING TYPE 25 BOOSTER AMPLIFIER

When adding Type 25 Amplifier to a basic cabinet, follow this simple plug-in operation.

Remove 8 ohm plug-in resistor from shipping position in speaker socket. Move two-pin speaker plug from cabinet connector chassis to speaker socket on amplifier. Place 8 ohm load resistor in speaker socket vacated by two-pin speaker plug. Take cable which is part of booster amplifier and connect to 6-pole receptacle on connector chassis. The 30-ft. console cable always remains connected to the 6-pole plug on Cabinet Connector Chassis.

Important: Use only one plug-in 8 ohm load resistor on multiple cabinet installation regardless of how many cabinets are used. Discard load resistor on additional amplifiers.

Volume Control Setting When Using Booster Amplifier

To adjust for console output differences, set the speaker selector switch to echo and proceed as follows:

1. Adjust console pedal and manual controls for maximum loudness.
2. With swell pedal at maximum position, play full chords and one pedal note.
3. Turn volume control from minimum setting up to point of distortion, then turn control down until distortion is gone.

Note: In a multiple Leslie installation, the volume control can provide for loudness balancing between speakers to provide full musical possibilities.

Distortion

Distorted sound is often caused by a too-high setting of the Leslie volume control. Amplifier gain is purposely greater than necessary, so low output consoles can still provide full sound power output from the Leslie. Arbitrary setting of this volume control at maximum will surely result in distortion when the organ swell control is fully opened.

Multiple Cabinet Installation

It is recommended that all Model 25 cabinets in a multiple hook-up use a Type 25 Amplifier. The first cabinet only in such a set-up requires a plug-in 8 ohm loading resistor. Discard all others. The second speaker in such a hook-up requires a 5A Relay. Each 5A Relay will supply outside power for up to three cabinets.

Connecting Cables

Cables for interconnecting Leslie Speakers must have six conductors and be fitted with 6-pole plug and socket connectors. To interconnect speakers, it only requires connecting one end of the cable to the extra speaker socket of the Leslie Type 25 Amplifier and the other end to the 6-pole plug in Cabinet Connector Chassis of next cabinet. This can be done with as many Leslies as desired. A complete 30-ft. 6-conductor cable with 6-pole connectors attached can be obtained by ordering Leslie Part No. 727.

Note: The 30-ft. console cable always connects from Console Connector Chassis to the 6-pole plug on Cabinet Connector Chassis.

Phasing

When two or more adjacent speakers are used in ensemble, they are normally phased so pedal frequencies will add instead of cancel. If im-

proper phasing of adjacent speakers is suspected, try reversing the red and black cable wires (pins 1 and 6) at one speaker. These wires should be connected to give loudest pedal output when adjacent speakers are sounding together.

USE AND CARE OF "ORPHEUS" SPEAKER

The cabinet should rest firmly on the floor. Any unevenness should be corrected by fitting wedges in place.

Belt Tension Adjustments

Adjust belt tension by loosening front motor wing nut and pulling motor assembly to left until belt is stretched. Release wing nut, and belt will assume proper tension. Tighten wing nut at this position. Do not attempt to stretch belt tight as difficulty in starting will result.

Tremolo Control

Tremolo control is obtained by turning the driving motor on and off by means of a relay in tone cabinet Connector Chassis which is controlled by the Leslie Console Tremolo Control. In a multiple Leslie installation, the Leslie tremolo control provides on-off tremolo control on all cabinets.

Note: The use of the Leslie Tremolo simultaneously with the Console tremulant or vibrato is not recommended.

Oiling

Place 20 or 30 drops of furnished oil or sewing machine oil in tube located at the back of the cabinet. For average use, oil every six months. If used constantly, oil every two months.

Cabinet Polishing

The finish on the Leslie cabinet is the same lacquer as used on fine furniture. Treat accordingly and use the same kind of furniture polish when needed.

Shipping

Cabinet may be moved or carried in any position with no special preparation. If it is to be shipped, the cabinet should be in an upright position with motor shipping blocks in place.

BROADCASTING AND RECORDING WITH THE LESLIE

To obtain full rich pipe-organ effects, the organ should be played at fairly high sound volume using a live studio. The microphone should be placed about ten to fifteen feet away from the speaker. For a smooth tremolo, adjust microphone height so that it is above the speaker louvres in the cabinet.

NON-ORGAN USE OF THE LESLIE

The Leslie Speaker when used as intended will provide performance

unmatched by that obtainable with "High Fidelity" apparatus. This organ speaker system incorporates many design features to enhance or improve musical characteristics of the electric organ. The design approach required to achieve this result is totally different in acoustical and electrical properties from what is needed in other applications. This specialized concept is what makes the Leslie unique, but restricts recommended use to electric organs.

SERVICING AND TECHNICAL INFORMATION

Caution: If rotor is spinning while lower back is removed, be very careful of damage or injury.

Replacement Parts for Servicing

Replacement transformers and tremolo relays should be obtained from the Electro Music factory. Standard type parts such as fuses, sockets, resistors and condensers, can be obtained from radio parts supply stores. The detailed parts list in this manual will give full parts replacement information.

Fuse, Console Connector

The connector uses a 5 ampere fuse to protect cabinet against overloads. The fuse will handle up to two Model 25 cabinets, assuming only one cabinet is using a booster amplifier.

Note: If two or more cabinets are to be used, the second cabinet in such a hook-up requires a 5A Relay. Each 5A Relay will supply outside power for up to three cabinets.

Electric Brake, Cabinet Connector

When the Tremolo Control Switch is in "off" position, braking of the tremulant motor is obtained by having the control relay apply direct current to the motor. During the off time, the direct current flows through the motor continually. No harm is done because the current is substantially below normal running ratings.

The DC braking voltage is obtained by rectifying and filtering line voltage. The following parts and functions are involved:

1. Silicon diode rectifier.
2. 200 mfd. filter condenser.
3. Filter choke coil to eliminate switching clicks in speaker.
4. Two 50 ohm current limiting resistors. These normally get quite warm during tremolo "off" periods.

Loudspeaker System

A special 12" speaker is mounted in a rigid acoustical enclosure. It is therefore important that the cabinet back is in place and securely fastened.

Because of the extremely strong permanent magnetic fields of this speaker, it is advisable not to attempt cone replacement repairs involving disassembly. Electro Music will either repair faulty unit or supply replacement.

Booster Amplifier

Amplifier is carefully engineered for long trouble-free operation. Maintenance is especially facilitated by the quick removable mountings, plug-in condenser, attached circuit diagram and protective fusing.

Since most service problems occur in the tubes or electrolytic condensers, the Model 25 offers especially easy servicing as these components are plug-in and can be substituted for comparison.

Amplifier is removed from cabinet by taking out screw that holds the front end of the amplifier to the bottom of the cabinet. After plugs are removed, the amplifier may be withdrawn. When pushing the amplifier back into place, align the back end of the chassis in approximate position so that the amplifier guide and hold-down clamp will engage the amplifier.

Fuse, Booster Amplifier

The amplifier uses a 2 amp fuse to protect the power supply against most short circuits. Before replacing a blown fuse, determine the cause of the fuse failure. Do not use a fuse of higher current rating than marked on the equipment.

Line Voltage

Exceptionally low or high line voltage may cause difficulties with amplifier operation. If the line voltage falls below 100 volts, unsatisfactory performance will result. Low line voltage can be caused by poor contacts in the cable wiring or exceptionally long cable. This condition should be corrected by use of heavier cable or some kind of voltage regulator. Adding the Leslie 5A Relay is an easy way to overcome low line voltage due to long cable drop. If the line voltage is above 120 volts, undue heating will take place and possible damage to components may result.

Voltage Readings

If the amplifier develops trouble resulting in unsatisfactory or non-operation that is not remedied by tube or electrolytic condenser replacements, the various voltages should be measured and compared to the voltages shown on the circuit diagram. The voltages shown were measured with a 20,000 ohms per volt multi-meter, and differences in meter resistance and line voltage variations, as well as parts tolerances, should be kept in mind. If an abnormally high or low voltage is noted, it usually indicates a defective part in the associated circuit.

Transformer Replacement

If output or power transformer is replaced, the wire colors must be noted and the new transformer wired with the same color identification. The output transformer plate lead wires should be as short as possible and be dressed close to the chassis. Replacement transformers should be obtained from Electro Music.

Tubes

Tubes are probably the most common source of amplifier difficulties. Checking in a tube tester does not always show all of the possible tube faults. The surest method is substitution with a new set to eliminate these units as a source of trouble. For reliable operation, it is generally recommended that tubes which have had a thousand hours of service be replaced. In this way, many difficulties can be avoided.

New tubes are not always perfect and can cause hum plus other troubles. If troubles come up at tube replacement time, the new tubes should be carefully checked or substituted.

MECHANICAL COMPONENTS

To Remove Motor

Remove the motor power plug from the amplifier socket and remove the two wing nuts that hold it to the shelf. The motor will drop down for removal. When replacing this motor, first position the belt on the motor pulley before it is lifted into place onto the mounting screws. Because the front wing nut controls the tremulant drive belt tension, this must be adjusted whenever the motor is replaced. To do this, pull the front wing nut to the left until the belt is tight. Release the wing nut and the belt will assume its proper tension. Tighten the wing nut at this position. Do not attempt to stretch the belt tight and hold it in that condition with the wing nut. Too much tension will result in noise and hard rotor starting.

Motor Maintenance

After several years of typical service, or a reasonably long period in commercial use, the motor might accumulate lint and dust. This accumulation interferes with proper ventilation and oiling. Time invested in cleaning the motor is well repaid by longer life. The motor can be removed easily and cleaned with solvent.

For cleaning purposes, before a motor can be completely taken apart, the pulley, pulley support ring, and oil tube assembly must be removed. When removing the end covers, be sure to note or mark the position of the bottom end cover with respect to the laminations. If this should be rotated relative to its original position, bearing misalignment will result and the motor will be noisy or even bind.

After reassembly, if there is some noise during motor operation, it is

probably due to temporary bearing unseating. A light tap with a fairly heavy tool on the laminations side will shake the assembly into proper position.

The mounting brackets used with the motor are adjusted to obtain 5/8" between centers of mounting holes. If the brackets are bent, they should be straightened to obtain this dimension. The motor pulley is held on to the shaft by the center screw, and after this is removed, the pulley may be pulled from the shaft.

To Remove Speaker

Remove upper compartment back and the screws in rim of bass speaker. Disconnect plug from amplifier. Avoid damage to cone by lifting speaker straight up for a short distance before taking out of cabinet.

Belt Replacement

For average service, the belts will last several years. In the event of any excessive belt wear, the pulley and mountings should be examined for rough surfaces or misalignment that might cause the wear.

A frayed or worn lower belt can cause noise by striking the lower shelf and should be replaced as follows: Remove the large upper back and lower compartment cover. Along the rim of the speaker, remove the mounting screws. Remove the connecting cable plug from the amplifier. The bass speaker can now be lifted from the shelf and out of the cabinet. To avoid possible cone damage, lift straight up for a short distance.

Pull the exposed rotor support from shaft. Place the new belt on the large pulley and pass the rest of the belt between the rotor and shelf toward the driving motor.

Remove the motor holding wing nut nearest the cabinet back to partially drop the motor. Temporarily, hook the new belt over the screw that held the wing nut.

Replace the bearing support on the rotor shaft and position the ends in the shallow locating channels at the speaker opening hole. Align the holes in the support with the speaker mounting holes in the locating channels.

Place the speaker back in position and install the two screws that hold the speaker at each end of bearing support. These screws should be just started in position and then the other two screws started. After all four screws are in position, they may be tightened.

Place the new belt on the driving motor pulley and put the motor back in position using the original holding wing nut.

Belt Tension Adjustment

Next, adjust the belt tension by first loosening the front motor wing nut only and pulling the motor assembly to the left until the belt is stretched. Release the wing nut and the belt will assume its proper tension. Tighten the wing nut at this motor position. Do not attempt to stretch the belt tight and hold it in that condition with the wing nut. Noise and hard starting will result.

To Replace Upper Oilite Rotor Bearing

1. Remove speaker.
2. Remove rotor support-rail and bearing assembly.
3. Remove fastener from bottom of oilite bearing and push bearing out of grommet.
4. Insert new bearing and replace fastener.

Lower Bearing

1. Lay cabinet on floor so that bottom is accessible.
2. Remove the two screws that fasten the bearing mounting plate to the cabinet, and entire bearing assembly can be pulled from the shaft.
3. Remove the top half of bearing clamp to replace the ball bearing assembly.
4. Reassemble bearing, replace on shaft, and fasten bearing mounting plate to the cabinet.

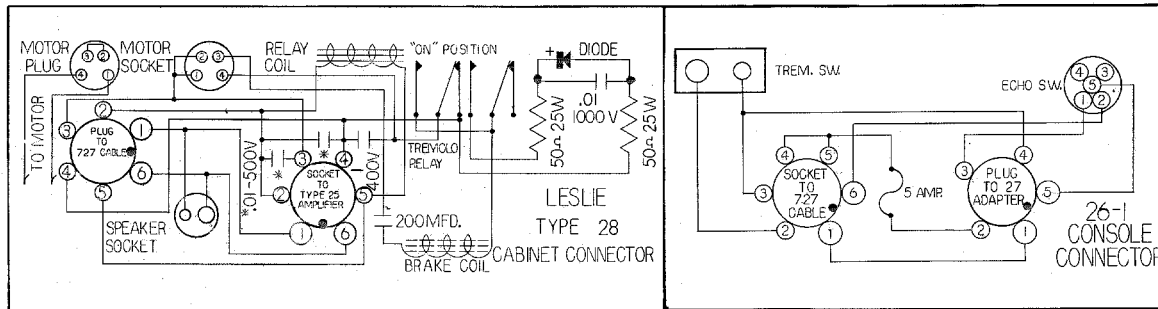
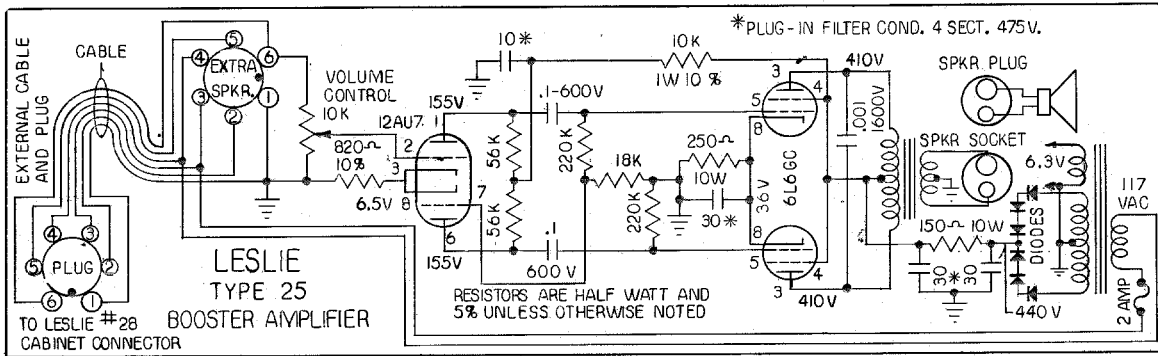
To Remove Tremulant Rotor

1. Remove speaker.
2. Remove upper bearing support and belt.
3. Using the large pulley as a handle, remove the rotor shaft by gently pulling straight up approximately 1/2 inch to clear pulley locating pin, then continue twisting with pulling action until shaft is free. The rotor then will be freed to be removed towards the back of the cabinet.
4. Replace the rotor with solid end of drum down. When replacing the rotor shaft in the rotor, a little oil or Vaseline may be used as a lubricant. Grommets are made of Neoprene and will not be damaged by such lubricants.

When inserting the shaft assembly, be sure the pulley location pin fits into the "V" groove formed by the round rotor holes. Hold the rotor in a position that will allow the lower shaft end to enter the bearing grommet easily.

To simplify the alignment of the shaft with the lower bearing, it may be easier to lay the cabinet on the floor and remove the lower bearing, assembly as in replacing the lower bearing.

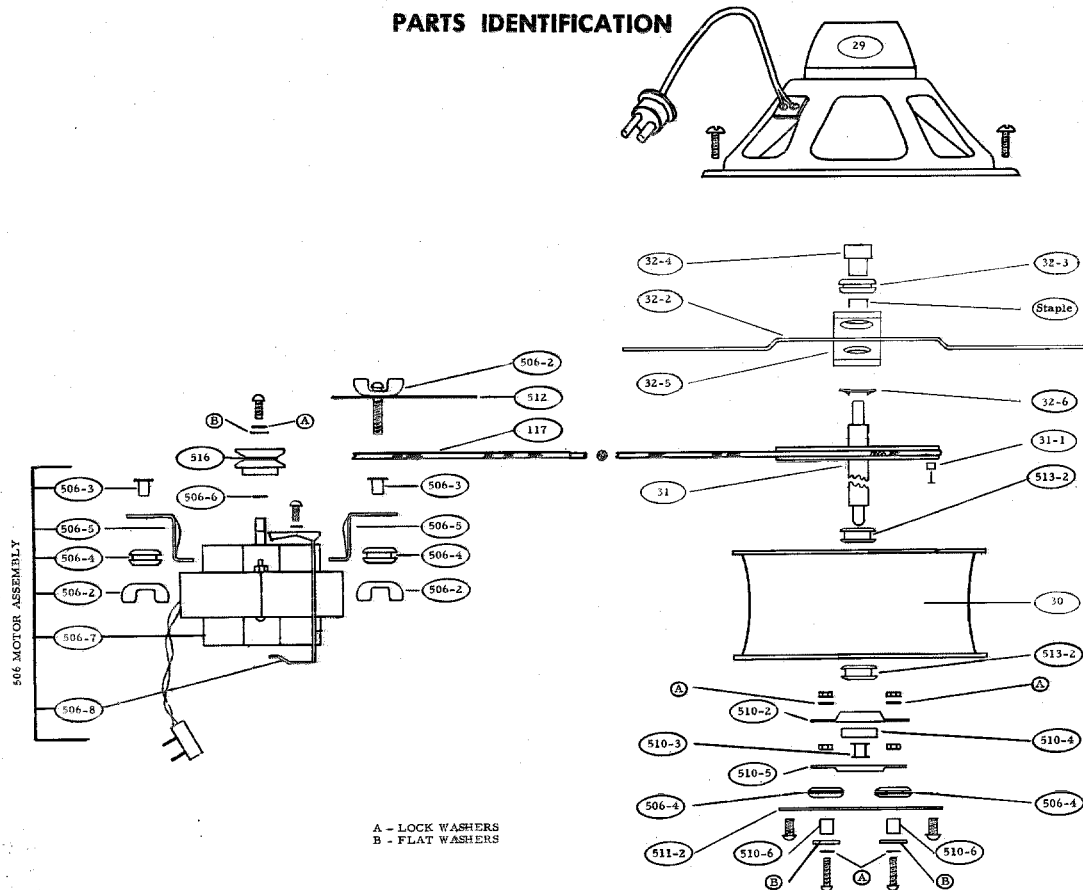
SCHEMATIC TYPE 25 BOOSTER AMPLIFIER



SCHEMATIC TYPE 28 CABINET CONNECTOR

SCHEMATIC TYPE 26-1 CONSOLE CONNECTOR

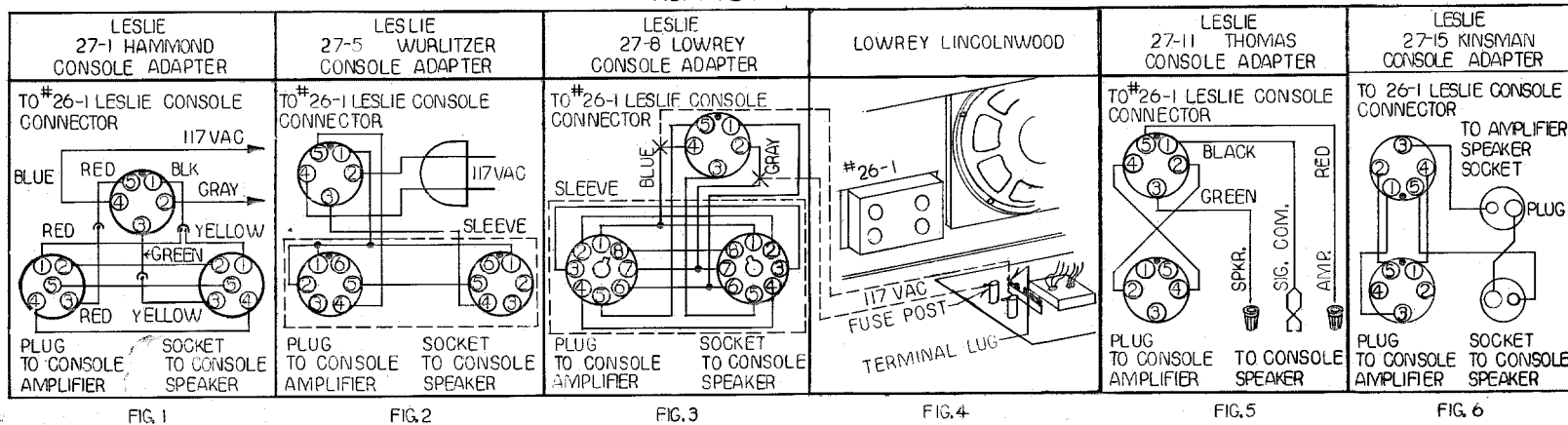
PARTS IDENTIFICATION



Upper Rotor Support Assembly
32

Lower Rotor Support Assembly
511

ADAPTER SCHEMATICS



PURPOSE OF ADAPTERS

A Leslie Adapter must be used with Leslie No. 26-1 Console Connector so various organs can be easily attached to the Model 25. The adapter basically provides the means by which signal can be controlled to sound at the Leslie Speaker, console speaker, or both, and provides console controlled A.C. power for the Leslie cabinet.

CONNECTING OF ADAPTERS

After plugging the 5-pole receptacle of adapter into No. 26-1 Chassis, proceed as follows:

No. 27-1 Hammond Adapter for M-1 and M-2 (Fig. 1)

1. Disconnect and discard the 5-pole plug and socket assembly from attached assembly by using screw terminals provided.
2. Disconnect green speaker wire from console amplifier V.C. terminals, then connect to green adapter wire and insulate with sleeving.
3. Connect red adapter wire to voice coil terminal vacated by green speaker wire.
4. Add black adapter wire to voice coil terminal having black speaker wire.
5. Connect grey and blue adapter wires to console amplifier A.C. terminals.

For M-3 (Fig. 1)

1. Remove the console speaker 5-pole plug from console amplifier socket and plug into 5-pole socket of Leslie adapter. Plug adapter 5-pole plug into the 5-pole amplifier socket.
2. Solder blue and grey wires to console amplifier A.C. lugs.

No. 27-5 Adapter for Gulbrandsen Spinets & Wurlitzer Models 44, 4410, 4420, 4200, 4250, (Fig. 2)

1. Disconnect 6-pole console speaker plug from amplifier and plug into 6-pole adapter socket.
2. Plug 6-pole adapter plug into console speaker socket.
3. Plug adapter power cord into chassis console amplifier power receptacle.

For 4100 (Fig. 2)

1. Remove dummy 6-pole plug from console amplifier and insert 6-pole adapter in its place.
2. Place dummy plug into adapter socket.
3. Plug adapter power cord into console amplifier power receptacle.

No. 27-8 Lowrey Adapter for Holiday and Heritage (Fig. 3)

1. Disconnect octal console speaker plug from amplifier and plug into octal adapter socket.
2. Plug octal adapter plug into console speaker socket.

For Lincolnwood (Fig. 4)

Proceed as above, but add steps as follows:

3. Cut the blue and grey adapter wires 3" from adapter sleeve (marked X on Fig. 3).
4. Insulate with wire nuts the cut blue and grey wires going to adapter sleeve.
5. The cut blue and grey wires to the 5-pole socket are stripped and soldered to fuse post and terminal lug of console amplifier (Fig. 4).

No. 27-11 Thomas (Fig. 5)

1. Cut one of voice coil wires near the speaker terminal. Strip both ends $\frac{1}{2}$ ".
2. Using furnished wire nuts, attach red adapter wire to cut wire from amplifier and attach green adapter wire to cut wire from speaker voice coil. Attach clip-on black wire to other terminal of voice coil that was left uncut.
3. Connect adapter 5-pole plug to amplifier socket to obtain 117V power.

No. 27-15 Kinsman (Fig. 6)

1. Disconnect 2-pole console speaker plug from amplifier and plug into 2-pole adapter socket.
2. Plug 2-pole adapter plug into console speaker socket.
3. Plug 5-pole adapter plug into console 5-pole socket.

MODEL 25 LESLIE ORGAN SPEAKER PARTS LIST

IMPORTANT: When ordering parts, Model and Serial Number of Leslie Speaker must be furnished to insure correct parts being supplied.

Part numbers of three, or less, digits are complete assemblies. Part numbers with dash numbers are sub-assemblies, or individual parts from complete assemblies. (Example: For complete motor assembly, order Part No. 506. For motor bracket, order Part Number 506-5).

EQUIPMENT USED AT SPINET ORGAN CONSOLES FOR PREPARATION OF LESLIE SPEAKER INSTALLATIONS

Part No.

- 26 Console Connector Kit. Includes No. 727 Cable, No. 26-1 Chassis, No. 26-2 Tremolo Assembly, No. 26-3 Echo Assembly and a No. 27 Console Adapter. (Specify type)
- 26-1 Console Connector Chassis Assembly only.
- 26-2 Tremolo Assembly only. Consists of tremolo switch case, knob, and switch with 2-conductor cable and plug attached. (State color switch case—"Brown", "Ivory" or "Ebony").
 - 428-3 Plastic tremolo switch case only. (Brown)
 - 428-4 Plastic tremolo switch case only. (Ivory)
 - 428-5 Plastic tremolo switch case only. (Ebony)
 - 428-6 Push-on knob. (Brown)
 - 428-7 Push-on knob. (Ebony)
 - 428-10 Switch retainer. (2 used—specify "tremolo")
 - 429-1 Tremolo electrical switch only.
- 26-3 Speaker selector assembly only. Consists of speaker selector case, knob, and switch with 3-conductor cable and 5-pin plug. State color switch case—"Brown", "Ivory" or "Ebony").
 - 3H-2 Plastic speaker selector switch case. (Brown)
 - 3H-3 Plastic speaker selector switch case. (Ivory)
 - 3H-4 Plastic speaker selector switch case. (Ebony)
 - 3H-5 Selector electrical switch only.
 - 428-6 Push-on knob. (Brown)
 - 428-7 Push-on knob. (Ebony)
 - 428-10 Switch retainer. (2 used—specify "speaker selector")

CONSOLE ADAPTER UNITS

- 27-1 Hammond
- 27-5 Wurlitzer & Gulbransen
- 27-8 Lowrey
- 27-11 Thomas
- 27-15 Kinsman

ELECTRICAL EQUIPMENT IN LESLIE CABINET

Part No.

- 28 Cabinet Connector Chassis, complete
 - 525-24 Brake silicon diode
 - 525-20 Brake condenser, 200 mfd.
 - 525-22 Brake suppressor coil
 - 28-3 Brake resistor, 50 ohms, 25 watts (2 used)
 - 730-3 Speaker socket
 - 28-2 Load resistor (plug-in type). Used only when No. 25 power amplifier is installed.
 - 28-5 Relay (DPDT)
 - 510-6 Relay mounting bushing
 - 502-10 Relay mounting rubber grommet
 - 525-14 Motor outlet socket (4 contact)
 - 525-16 Fuse holder
- 29 PM Speaker. NOTE: Replacement cones not available. Factory installed only.
 - 29-1 Cord and 2-pin plug
- 506 Motor Assembly, Less Pulley
 - 506-2 Wing nut (2 used)
 - 506-3 Metal shoulder bushing (2 used)
 - 506-4 Rubber grommet (2 used)
 - 506-5 Bracket (2 used)
 - 506-6 Pulley support wire ring
 - 506-7 Motor only
 - 506-8 Oiling tube
 - 506-9 Four-pin motor plug and cap
- 512 Adjustable Mounting Plate for Motor
- 516 Motor Pulley

TREMULANT ROTOR EQUIPMENT

- 30 Rotor (with grommets)
 - 513-2 Rubber grommet, ends (2 used)
- 31 Rotor Shaft, with Pulley
 - 31-1 Rotor Indexing Rubber Bushing
- 32 Upper Rotor Support Assembly
 - 32-2 Rail
 - 32-3 Grommet
 - 32-4 Oilite Bearing

Part No.

- 32-5 Oil Felt
- 32-6 Bearing Retainer
- 511 Lower Rotor Support Assembly
 - 510-2 Bearing clamp, upper half
 - 510-3 Bearing grommet
 - 510-4 Ball bearing
 - 510-5 Bearing clamp, lower half
 - 510-6 Metal bushing (2 used)
 - 506-4 Rubber grommet (2 used)
 - 511-2 Lower support mounting plate
- 117 Rotor Belt

ACCESSORIES

- 25 Amplifier, Complete with tubes (20 watts)
 - 525-5 Chassis mounting strip (2 used)
 - 525-6 Rubber shoulder bushings (4 used)
 - 525-7 Metal Bushings (4 used)
 - 525-8 Amplifier hold-down clip (front)
 - 25-1 Power transformer
 - 25-2 Output transformer
 - 525-19 Filter resistor, 150 ohms, 10 watts
 - 725-15 Filter condenser, plug-in (30-30-30-10 mfd.)
 - 525-21 Filter condenser socket
 - 625-18 Volume control (10,000 ohms)
 - 25-4 Bias resistor, 250 ohms, 10 watts
 - 25-5 Power silicon diode (4 used) 400v
 - 25-8 Power silicon diode (2 used) 600v
 - 25-7 Diode rect. assy. complete
 - 730-3 Speaker Socket (2 contact)
 - 525-16 Fuse holder

Note: Parts such as resistors, condensers, and sockets available from electronic supply companies.

- 727 30-ft. Six-Conductor Cable with Six Contact Plug and Socket attached. For Console to Speaker Cable, Speaker Extension Cable, and Speaker to Speaker Jumper.
 - 727-1 Six-conductor bulk cable only. Specify any length.
 - 727-2 Six-pole plug and cap for 727-1
 - 727-3 Six-pole receptacle and cap for 727-1 cable
 - 727-4 Five-pole plug and cap
- 5A Power Relay

MISCELLANEOUS PARTS**Part No.**

- 25-11 Upper back cover
- 526-10 Plastic oil tube
- 526-21 Lower back cover
- 530 Bottle Lubricating Oil

MISCELLANEOUS SCREWS**Thread and Length****Quantity and Where Used**

- | | |
|---------------------------|-----------------------------------------------------------|
| 8/32 x 7/8" | (2) Fasten bearing clamps to supports |
| 10/24 x 3/8" | (2) Fasten bass rotor lower support |
| 10/24 x 7/8" | (3) Fasten amplifier and cabinet connector to lower shelf |
| 10/24 x 7/8" | (1) In slot of 512 (place in 506-2 wing nut) |
| 10/24 x 1" | (4) Fasten 29 to shelf |
| 10/24 x 1 1/2" (black) | (8) Fasten backs to cabinet |
| No. 10 x 7/8" Sheet metal | (2) Fasten 512 to shelf |
| 10/24 x 1 3/8" | (2) Wing nuts for mounting motor |
| 10/24 x 1 1/2" | (1) Motor mounting stud |
| 10/24 "T" nuts | Used throughout cabinet |
| Parker Kalon Self-tap | (4) Hold plastic case bottom cover |
| No. 6 x 1/2" Wood Screws | (4) Control cases to console |
| 8/32 x 3/8" | (1) Holds 516 to 506-7 |
| No. 8 x 3/8" Sheet Metal | (3) Holds 525-8 to Cabinet |